

IP/05/00-182

## Sertifikaat

REPUBLIEK VAN SUID AFRIKA

PATENT KANTOOR  
DEPARTEMENT VAN HANDEL  
EN NYWERHEID

## Certificate

REPUBLIC OF SOUTH AFRICA

PATENT OFFICE  
DEPARTMENT OF TRADE AND  
INDUSTRY

Hiermee word gesertifiseer dat  
This is to certify that

the documents attached hereto are true copies of Forms P2, P6,  
and provisional specification and drawings of South African Patent Application  
No. 2004/0679 in the names of Eichhorn Robert and Bogdanovic Bogdan

Filed : 28 January 2004 ✓

Entitled : Roller

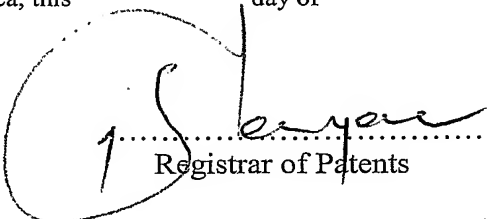
## PRIORITY DOCUMENT

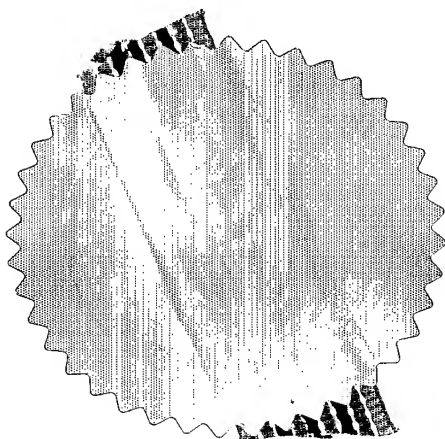
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Geteken te  
**PRETORIA**  
Signed at

in die Republiek van Suid-Afrika, hierdie  
in the Republic of South Africa, this

7 dag van  
March 2005  
day of

  
Registrar of Patents



REPUBLIC OF SOUTH AFRICA		REGISTER OF PATENTS		PATENTS ACT, 1978		
OFFICIAL APPLICATION		LODGING DATE: PROVISIONAL		ACCEPTANCE DATE		
21	013	2004/0679		22	28 JAN 2004	
INTERNATIONAL CLASSIFICATION		LODGING DATE: COMPLETE		GRANTED DATE		
51		23				
FULL NAME(S) OF APPLICANT(S)/PATENTEE(S)						
71	EICHHORN, ROBERT BOGDANOVIC, BOGDAN					
APPLICANTS SUBSTITUTED:				DATE REGISTERED		
71						
ASSIGNEE(S)				DATE REGISTERED		
71						
FULL NAME(S) OF INVENTOR(S)						
72	1. EICHHORN, ROBERT 2. BOGDANOVIC, BOGDAN					
PRIORITY CLAIMED		COUNTRY		NUMBER		
N.B. Use International abbreviation for country (see Schedule 4)		33	NIL	31	NIL	
				32	NIL	
TITLE OF INVENTION						
54	ROLLER					
ADDRESS OF APPLICANT(S)/PATENTEE(S)						
1. 31P THE HATCH, SUNNY ROAD, BENONI, 1501, GAUTENG, SOUTH AFRICA 2. 19 NIGHTINGALE CRESCENT, RAND-EN-DAL, KRUGERSDORP, SOUTH AFRICA						
ADDRESS FOR SERVICE				S & F REF		
74	SPOOR & FISHER, SANDTON			PA136742/P		
PATENT OF ADDITION NO.			DATE OF ANY CHANGE			
61						
FRESH APPLICATION BASED ON			DATE OF ANY CHANGE			

**APPLICATION FOR A PATENT**AND ACKNOWLEDGEMENT OF RECEIPT  
(Section 30 (1) – Regulation 22)**R 006000**

HASR 711

The granting of a patent is hereby requested by the undermentioned applicant on the basis of the present application filed in duplicate

OFFICIAL APPLICATION NO.

21	01	2004/0679
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REPUBLIC OF SOUTH AFRICA  
S & F REFERENCE

PA136742/P

FULL NAME(S) OF APPLICANT(S)

71	1. EICHHORN, ROBERT 2. BOGDANOVIC, BOGDAN
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ADDRESS(ES) OF APPLICANT(S)

	1. 31P THE HATCH, SUNNY ROAD, BENONI, 1501, GAUTENG, SOUTH AFRICA 2. 19 NIGHTINGALE CRESCENT, RAND-EN-DAL, KRUGERSDORP, SOUTH AFRICA
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TITLE OF INVENTION

54	ROLLER
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THE APPLICANT CLAIMS PRIORITY AS SET OUT ON THE ACCOMPANYING FORM P.2. THE EARLIEST PRIORITY CLAIM IS:

COUNTRY: NIL	NUMBER: NIL	DATE: NIL
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THIS APPLICATION IS FOR A PATENT OF ADDITION TO PATENT APPLICATION NO.

21	01	
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THIS APPLICATION IS A FRESH APPLICATION IN TERMS OF SECTION 37 AND IS BASED ON APPLICATION NO.

21	01	
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THIS APPLICATION IS ACCOMPANIED BY:

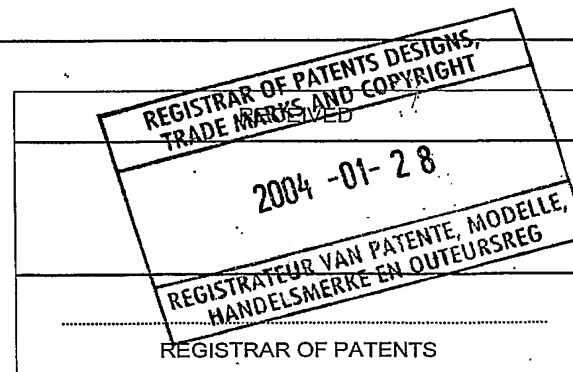
- ☒ 1. A single copy of a provisional specification of 6 pages.
- ☒ 2. Drawings of 7 sheets.
- ☐ 3. Publication particulars and abstract (Form P.8 in duplicate).
- ☐ 4. A copy of Figure of the drawings (if any) for the abstract.
- ☐ 5. Assignment of invention.
- ☐ 6. Certified priority document.
- ☐ 7. Translation of the priority document.
- ☐ 8. Assignment of priority rights.
- ☐ 9. A copy of the Form P.2 and the specification of S.A. Patent Application No.
- ☐ 10. Declaration and power of attorney on Form P.3.
- ☐ 11. Request for ante-dating on Form P.4.
- ☐ 12. Request for classification on Form P.9.
- ☒ 13. Form P.2 in duplicate.
- ☐ 14. Other.

74 ADDRESS FOR SERVICE: SPOOR &amp; FISHER, SANDTON

Dated: 28 January 2004

*[Signature]*

SPOOR & FISHER  
PATENT ATTORNEYS FOR THE APPLICANT(S)



REPUBLIC OF SOUTH AFRICA  
PATENTS ACT, 1978

## PROVISIONAL SPECIFICATION

(Section 30(1) – Regulation 27)

OFFICIAL APPLICATION NO.

21	01	. 2004/0679
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LODGING DATE

22	28 JANUARY 2004
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FULL NAMES OF APPLICANTS

71	EICHHORN, ROBERT BOGDANOVIC, BOGDAN
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FULL NAMES OF INVENTORS

72	EICHHORN, ROBERT BOGDANOVIC, BOGDAN
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TITLE OF INVENTION

54	ROLLER
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## FIELD OF THE INVENTION

This invention relates to a roller and more particularly, but not exclusively to a conveyor idler roller.

## SUMMARY OF THE INVENTION

According to the invention a roller includes a shell having an outer surface and an inner surface with a plurality of spaced inwardly projecting shell formations on the inner surface of the shell, and at least one reinforcing member within the shell, the reinforcing member having a plurality of spaced outwardly projecting formations which locate between the inwardly projecting shell formations.

In the preferred form of the invention two reinforcing members are provided, with each reinforcing member having an outer end and an inner end, and with a bearing housing receiving zone located at the outer end within which bearing housing receiving end, a bearing housing is located for rotatably supporting the roller on a shaft.

The bearing housing is preferably an interference fit within the bearing housing receiving zone.

The spaced inwardly projecting shell formations are preferably axially extending fins which preferably project radially inwardly. Similarly the spaced outwardly projecting formations of the reinforcing member are preferably axially extending fins which preferably project radially outwardly. Preferably each fin of the reinforcing member locates between a pair of fins of the shell. In one form of the invention the fins of the shell may thus be in meshing or interlocking engagement with the fins of the reinforcing member. Preferably the fins of the reinforcing member are an interference fit between the fins of the shell.

The fins of the reinforcing member preferably taper inwardly from the outer end to the inner end of the reinforcing member similarly the fins of the shell preferably taper inwardly along their length to facilitate interlocking engagement with the fins of the reinforcing member.

The reinforcing member may include a plurality of spaced inwardly projecting formations which may be axially extending radially inwardly projecting fins for engagement with a core located within the reinforcing member.

The core preferably includes a plurality of spaced outwardly projecting core formations which locate between the inwardly projecting formations of the reinforcing member. The core formations may be axially extending radially outwardly extending fins.

The radially inwardly projecting fins of the reinforcing member and the radially outwardly extending fins of the core may taper along their length to facilitate interlocking engagement of the fins. This interlocking engagement is preferably by way of an interference fit between the fins.

The core may include a hollow tubular section from which the core fins radiate outwardly and through which hollow tubular section the shaft can pass.

The shell is preferably integrally moulded. Likewise the reinforcing members and the cores are preferably each an integral moulding.

In one form of the invention the shell contains a ring projecting inwardly from substantially midway between the ends of the shell, and from which ring the fins extend axially towards opposite ends of the shell.

The fins of the shell preferably taper inwardly from the inner surface of the shell to the tips of the fins. The fins of the reinforcing member preferably have substantially parallel sides.

The scope of the invention extends separately to the shell, the reinforcing member and to the core.

#### **BRIEF DESCRIPTION OF THE DRAWINGS**

**Figure 1** is a cross-sectional side view of a roller according to the invention;

**Figure 2** is a perspective view of the shell of the roller;

**Figure 3** is a cross-sectional side view of the shell;

**Figure 4** is an end view of the shell;

**Figure 5** is a perspective view of a reinforcing member of the roller;

**Figure 6** is a cross-sectional side view of the reinforcing member;

**Figure 7** is an end view of the reinforcing member;

**Figure 8** is a perspective view of a core of the roller;

**Figure 9** is a cross-sectional side view of the core; and

**Figure 10** is an end view of the core.

#### **DETAILED DESCRIPTION OF THE DRAWINGS**

Referring firstly to figure 1, a roller 10 has a shell 12 with two reinforcing members 14 within the shell 12. A core 16 is located within each reinforcing member 14. Each reinforcing member 14 has a bearing housing receiving zone 18 for a bearing housing 20. A shaft 22 is supported within bearings 24 located within the bearing housings 20.

Referring now to figures 2 to 4, the shell 12, which is injection moulded from high density polyethylene, has an outer surface 26, over which a conveyor belt (not shown) can run, an inner surface 28, and opposite ends 30. Fins 32 radiate inwardly from the inner surface 28. Each fins 32 tapers outwardly along its length from its respective end 30 of the shell to a central ring 34. In addition each fin 32 tapers inwardly from the inner surface 28 of the shell 12 to a tip 36.

Referring now to figures 5 to 7, each reinforcing member 14 consists of a tubular section 38 with fins 40 radiating outwardly therefrom. The bearing housing receiving zone 18 is located between an inwardly extending ring 44 and an outer end 46 of the reinforcing member 14. The fins 40 taper inwardly along their length from the outer end 46 to an inner end 48 of the reinforcing member 14. The fins 40 have substantially parallel sides and thus do not taper from root to tip in the same fashion as the fins 32 of the shell 12. As with the shell 12, each reinforcing member 14 is injection moulded from high density polyethylene. Fins radiating inwardly from the tubular section between the ring 44 and the inner end 48 are not shown as the core 16 may be omitted as described in more detail below.

Referring now to figures 8 to 10, each core 16 consists of a hollow tubular section 50 with fins 52 radiating outwardly therefrom. Each core 16 is injection moulded from high density polyethylene.

The roller 10 is assembled by pressing the reinforcing members 14 into opposite ends of the shell 12, with the fins 32 and 40 being in meshing or interlocking engagement. The effect of this is that the fins 32 of the shell 12, the fins 40 of the reinforcing members 14, the tubular section 38 of the reinforcing member 14, and the tubular part of the shell 12, together define two solid circular cylindrical regions of high density polyethylene which strengthen the roller 10.

Should it be necessary further to strengthen the roller 10, the cores 16 are pressed into their respective reinforcing members 14. It will be appreciated that the effect of this will be to increase the thickness of the two solid circular



cylindrical regions.

The shaft 22 is then inserted and the bearing housings 20 are located in their respective bearing housing receiving zones 18.

The roller 10 has the advantage that it is relatively light weight. In addition the solid circular cylindrical sections of high density polyethylene provide strength and material which can be worn away by a conveyor belt (not shown) without damage being caused to the belt, which could be the case if the shell was made of steel. A further advantage of the roller 10 is that recycled plastic can be used to mould some or all of the plastic components of the roller 10. This is advantageous from an environmental point of view. A yet further advantage of the roller 10 is that the shell 12, reinforcing members 14 and cores 16 can be injection moulded with low cycle times because of their configuration. Furthermore, the configuration of these components provides for the correct orientation of the plastic molecules which results in greater strength of these components.

It will be appreciated that many modifications or variations of the invention are possible without departing from the spirit or scope of the invention.

DATED THIS 28<sup>TH</sup> DAY OF JANUARY 2004

  
SPOOR & FISHER  
APPLICANT'S PATENT ATTORNEYS

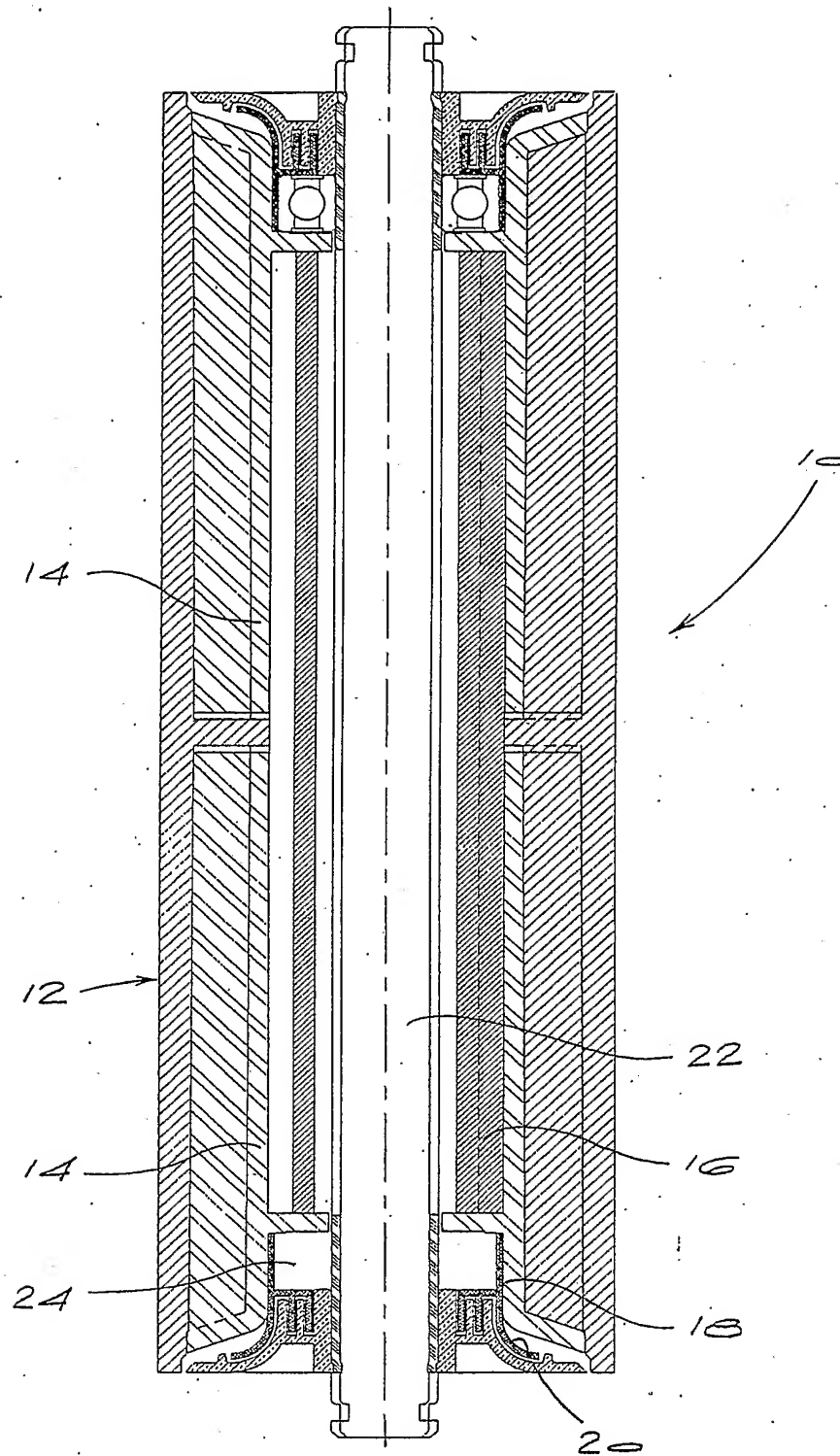


Fig. 1

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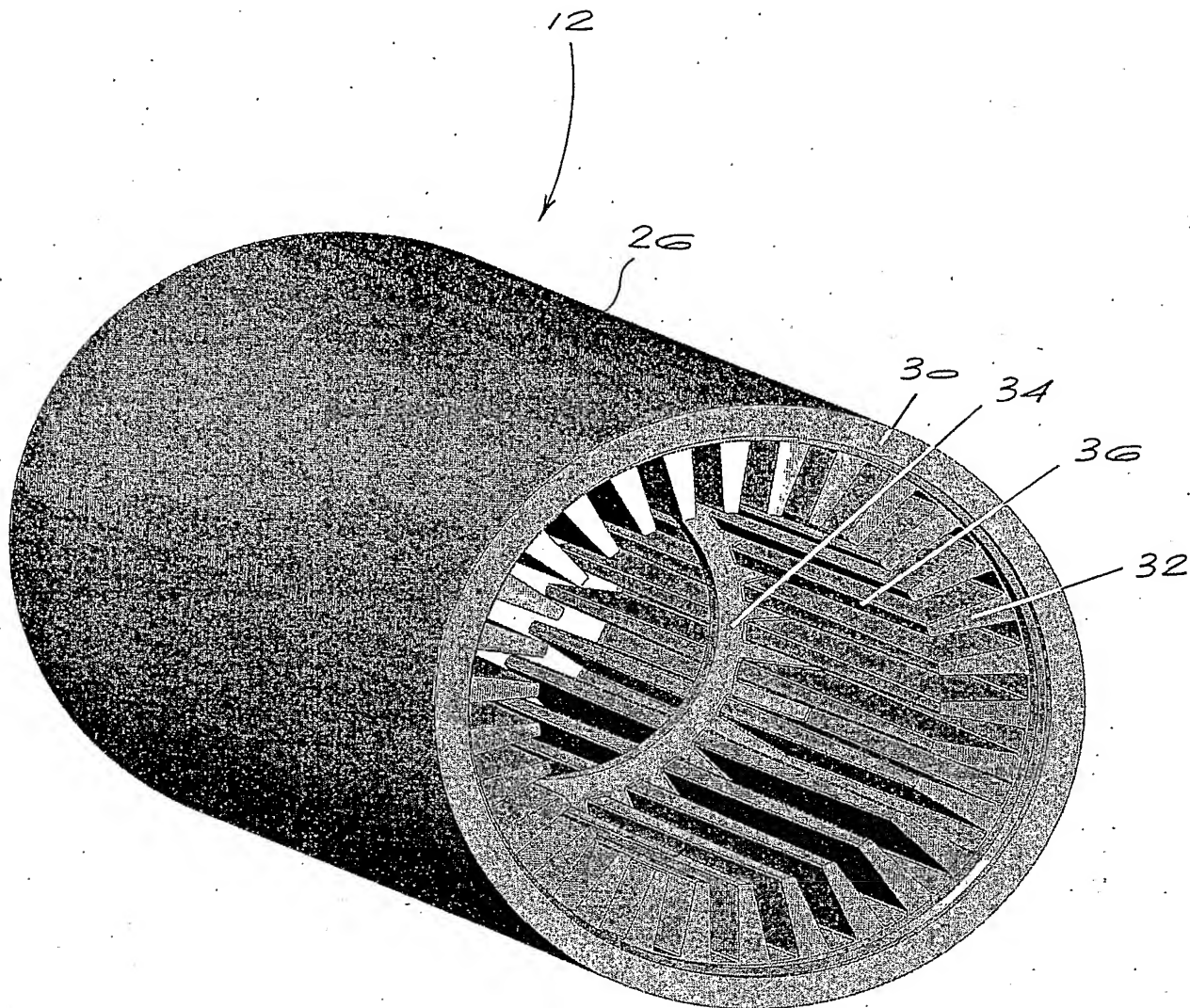
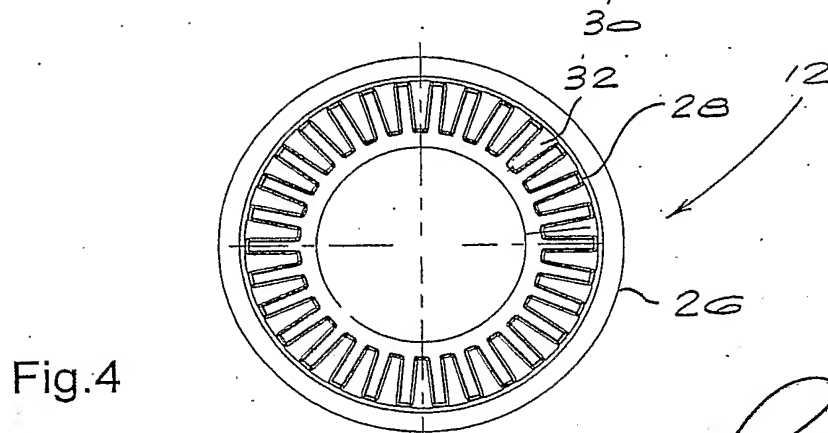
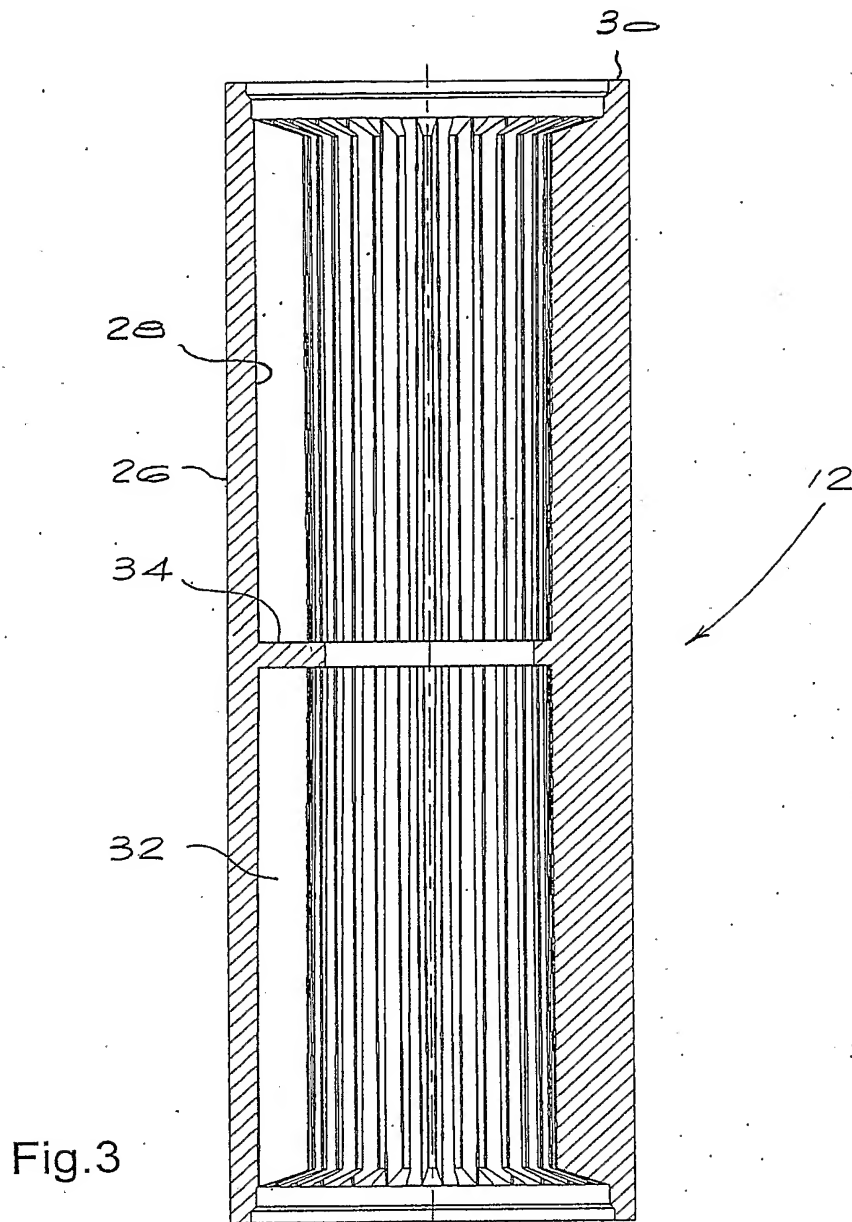


Fig.2



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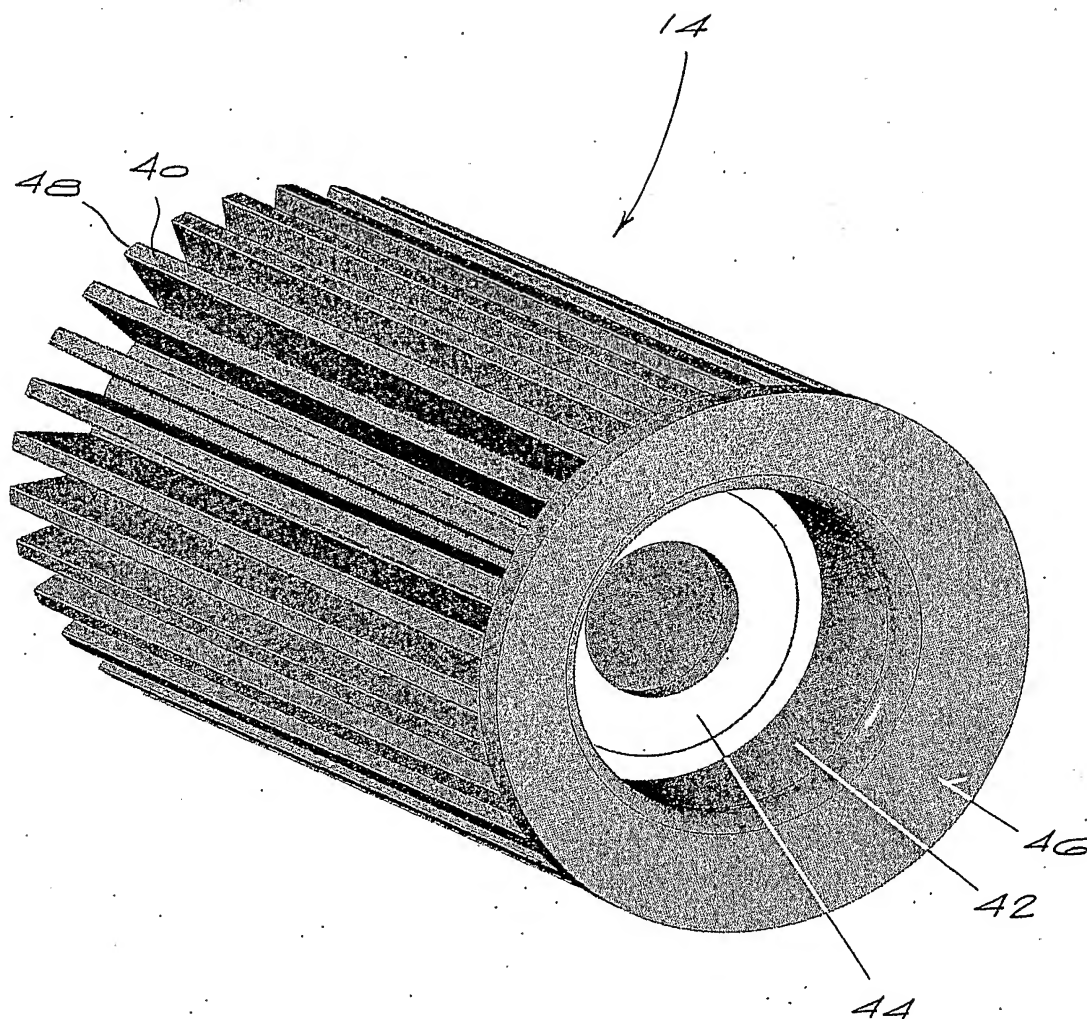


Fig.5

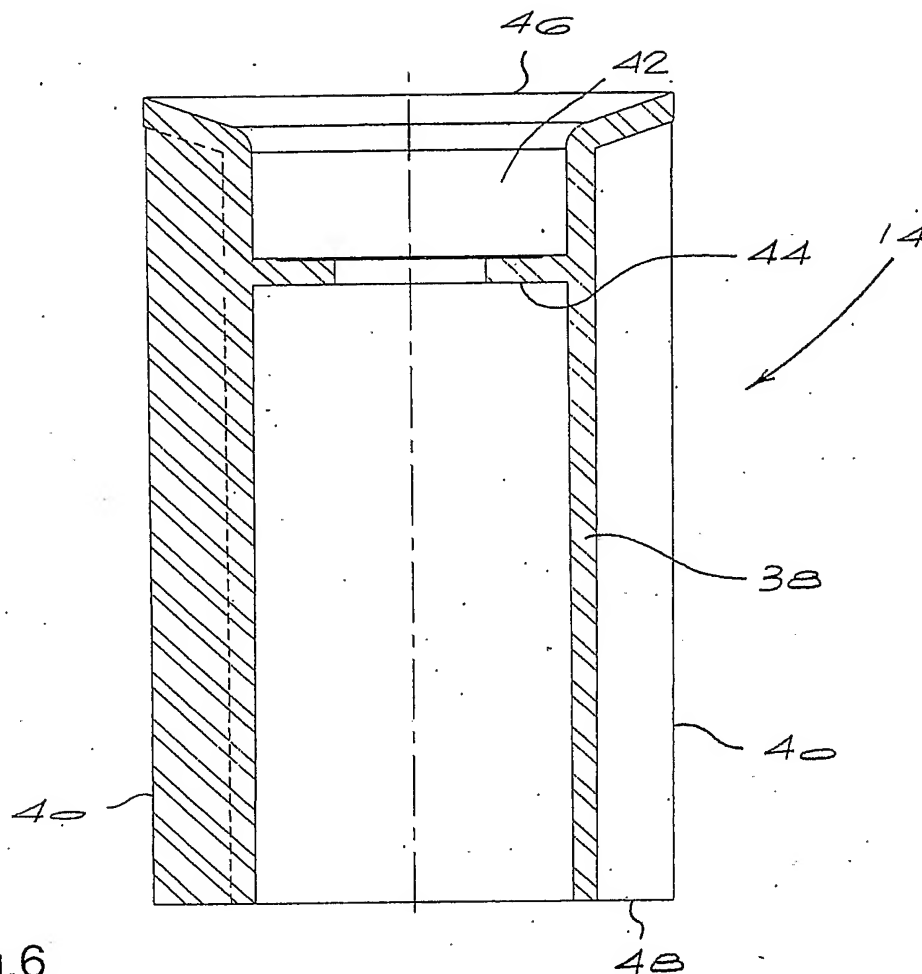


Fig. 6

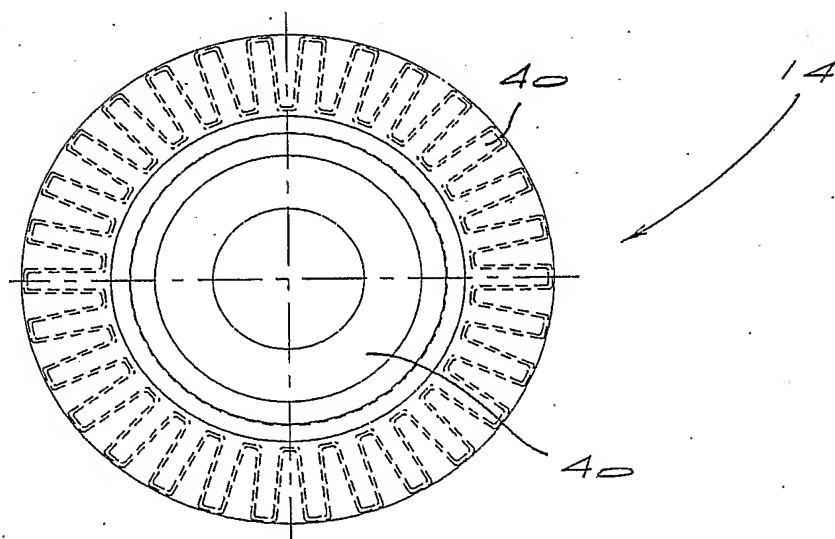


Fig. 7

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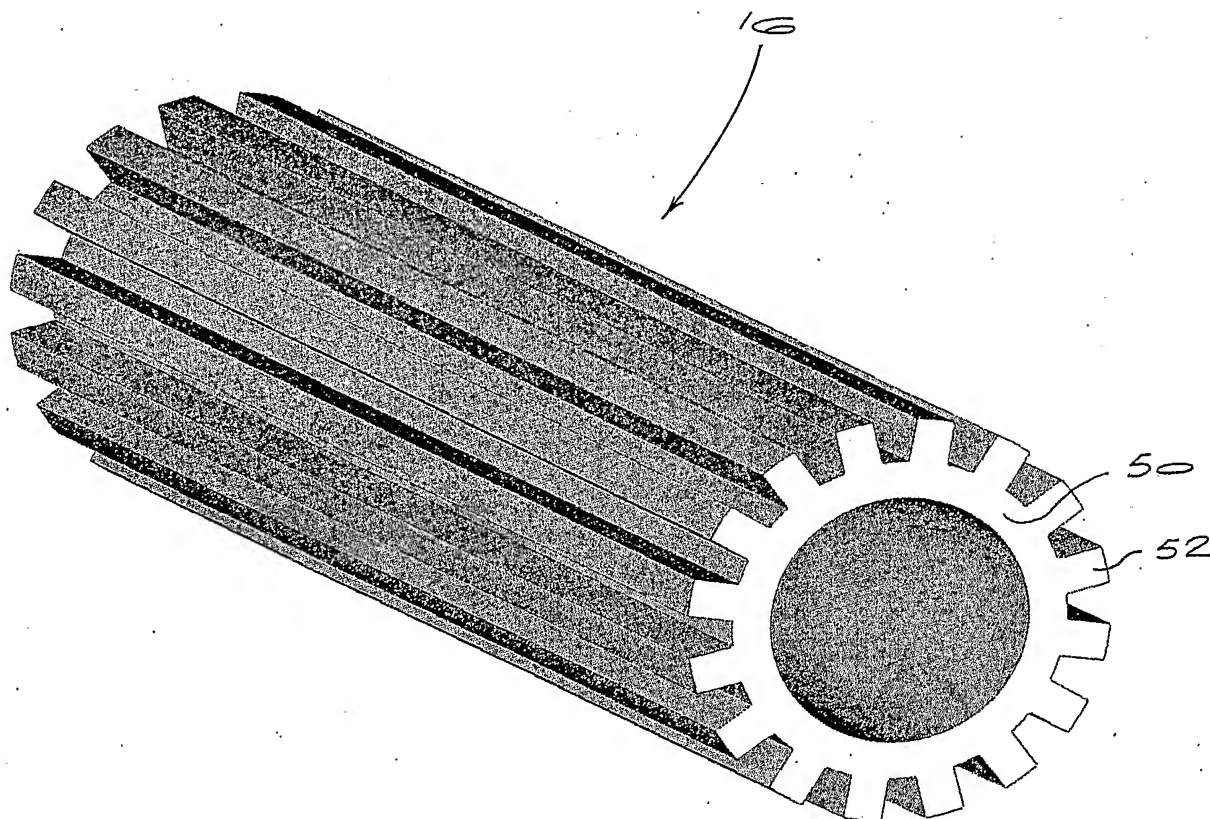


Fig.8

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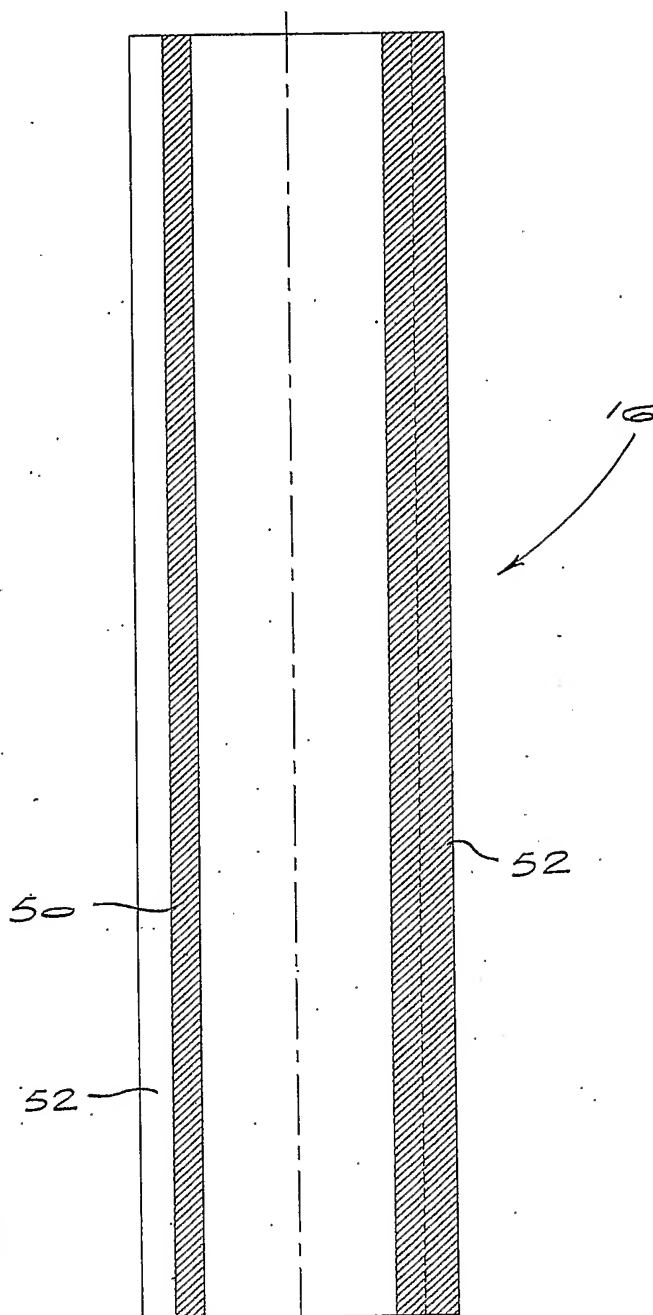


Fig. 9

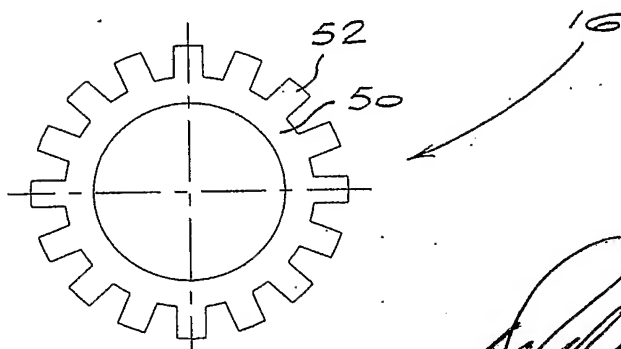


Fig. 10

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